

C/015/018 Incoming ✓

#5020



Interwest Mining Company
Huntington Office
P. O. Box 310
15 North Main Street
Huntington, UT 84528

October 7, 2015

Electronically Submitted

Utah Coal Program
Utah Division of Oil, Gas, and Mining
1594 West North Temple, Suite 1210
P.O. Box 145801
Salt Lake City, Utah 84114-5801

RECEIVED

OCT 16 2015

DIV. OF OIL, GAS & MINING

Subj: Amendment to Reduce the Hydrologic Monitoring Program for Sites Within the Mine Permit Boundaries, PacifiCorp, Deer Creek Mine C/015/0018, Emery County, Utah.

PacifiCorp, by and through its wholly-owned subsidiary, Interwest Mining Company as mine manager, hereby submits an amendment to amend Volume 9, Hydrologic Volume, Appendix A and Deer Creek Mine Volume 1, to reduce the water monitoring responsibilities as outlined in the hydrologic monitoring program.

In 2013, Energy West Mining Company (the mines past operator) submitted an amendment to reduce its monitoring responsibilities for sites within the Deer Creek, Cottonwood/Wilberg, and Trail Mountain mines. The Division agreed with PacifiCorp when they gave conditional approval for this amendment (Task ID #4443) on November 10, 2014 that its underground mining operations did not impact quantity or quality of spring flow of the over-lying springs.

Interwest is now proposing to remove five springs and two wells from its monitoring program. The springs and one well were retained in the monitoring program in 2013 since they were considered at the time to be strategic monitoring sites as plans for accessing the Cottonwood Tract from the 2nd West Section in the Deer Creek Mine were being discussed. PacifiCorp is no longer the holder of the Cottonwood Tract and therefore, has no future plans for using this access. The Deer Creek Mine was sealed in April of 2015 and monitoring these springs and well are no longer relevant.

Subsidence surveys have been conducted from the time of development and extraction operations of the underground mine. No subsidence has been recorded for the area where the springs and well are located. Subsidence surveys of this area were terminated in 2008 as subsidence was determined to be substantially complete.

PacifiCorp has conducted extensive research regarding the interrelationships between the surface and groundwater hydrologic systems and the potential impacts associated with its underground mining operations. Analysis has included; seep and spring surveys, drainage surveys, baseline data collection, in-house and consultant hydrologic studies and government and non-government

research project. The June 5, 2014 submittal, appendices A – D contains some of these research projects. Please review the documentation in the June 5, 2014 submittal (Task ID #4443).

The second well is associated with the Deer Creek waste rock site. This site was sold under a purchase agreement with Bowie Refined Coals LLC in August 2015. PacifiCorp feels that no other justification is needed to remove this site from the monitoring program since it no longer retains jurisdiction over the site.

This submittal includes the amended Volume 9, Appendix A and Deer Creek Volume 1, Part 2. Sites that are proposed for removal are "~~struck-out~~". A justification document for removal of the five springs and one well is also included. This document includes an outline of the spring location, lease association, water quality, a graph showing flow versus the Palmer Drought Index, and photos of the sites. With this document, PacifiCorp is claiming that there has been no impact to the springs or well due to its underground mining operations.

The required C1/C2 forms are included. If you have any questions concerning this action, please contact Dennis Oakley at 435-687-4825.

Sincerely,



Kenneth Fleck

Geology and Environmental Affairs Manager

Cc: file

APPLICATION FOR COAL PERMIT PROCESSING

Permit Change ☒ New Permit ☐ Renewal ☐ Exploration ☐ Bond Release ☐ Transfer ☐

Permittee: PacifiCorp

Mine: Deer Creek Mine

Permit Number: C/015/0018

Title: Amendment to Reduce the Hydrologic Monitoring Program for Sites Within the Mine Permit Boundaries, PacifiCorp, Deer Creek Mine C/015/0018, Emery County, Utah.

Description, Include reason for application and timing required to implement:

Instructions: If you answer yes to any of the first eight (gray) questions, this application may require Public Notice publication.

- ☐ Yes ☒ No 1. Change in the size of the Permit Area? Acres: _____ ☐ increase ☐ decrease.
- ☐ Yes ☒ No 2. Is the application submitted as a result of a Division Order? DO# _____
- ☐ Yes ☒ No 3. Does the application include operations outside a previously identified Cumulative Hydrologic Impact Area?
- ☐ Yes ☒ No 4. Does the application include operations in hydrologic basins other than as currently approved?
- ☐ Yes ☒ No 5. Does the application result from cancellation, reduction or increase of insurance or reclamation bond?
- ☐ Yes ☒ No 6. Does the application require or include public notice publication?
- ☐ Yes ☒ No 7. Does the application require or include ownership, control, right-of-entry, or compliance information?
- ☐ Yes ☒ No 8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
- ☐ Yes ☒ No 9. Is the application submitted as a result of a Violation? NOV # _____
- ☐ Yes ☒ No 10. Is the application submitted as a result of other laws or regulations or policies?
Explain: _____
- ☐ Yes ☒ No 11. Does the application affect the surface landowner or change the post mining land use?
- ☐ Yes ☒ No 12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2)
- ☐ Yes ☒ No 13. Does the application require or include collection and reporting of any baseline information?
- ☐ Yes ☒ No 14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
- ☐ Yes ☒ No 15. Does the application require or include soil removal, storage or placement?
- ☐ Yes ☒ No 16. Does the application require or include vegetation monitoring, removal or revegetation activities?
- ☐ Yes ☒ No 17. Does the application require or include construction, modification, or removal of surface facilities?
- ☒ Yes ☐ No 18. Does the application require or include water monitoring, sediment or drainage control measures?
- ☐ Yes ☒ No 19. Does the application require or include certified designs, maps or calculation?
- ☐ Yes ☒ No 20. Does the application require or include subsidence control or monitoring?
- ☐ Yes ☒ No 21. Have reclamation costs for bonding been provided?
- ☐ Yes ☒ No 22. Does the application involve a perennial stream, a stream buffer zone or discharges to a stream?
- ☐ Yes ☒ No 23. Does the application affect permits issued by other agencies or permits issued to other entities?

Please attach four (4) review copies of the application. If the mine is on or adjacent to Forest Service land please submit five (5) copies, thank you. (These numbers include a copy for the Price Field Office)

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein.

Kenneth Fleck
Print Name

Kenneth S. Fleck
Sign Name, Position, Date

Manager of Environmental Affairs OCTOBER 7, 2015

Subscribed and sworn to before me this 7th day of October, 2015

Kristy Prettyman
Notary Public

My commission Expires:

Attest: State of Utah 03-07, 2016) ss:
County of Emery



For Office Use Only:

Assigned Tracking
Number:

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OCT 16 2015

DIV. OF OIL, GAS & MINING

APPLICATION FOR COAL PERMIT PROCESSING

Detailed Schedule Of Changes to the Mining And Reclamation Plan

Permittee: PacifiCorp

Mine: Deer Creek Mine

Permit Number: C/019/0018

Title: Amendment to Reduce the Hydrologic Monitoring Program for Sites Within the Mine Permit Boundaries, PacifiCorp, Deer Creek Mine C/015/0018, Emery County, Utah.

Provide a detailed listing of all changes to the Mining and Reclamation Plan, which is required as a result of this proposed permit application. Individually list all maps and drawings that are added, replaced, or removed from the plan. Include changes to the table of contents, section of the plan, or other information as needed to specifically locate, identify and revise the existing Mining and Reclamation Plan. Include page, section and drawing number as part of the description.

DESCRIPTION OF MAP, TEXT, OR MATERIAL TO BE CHANGED[illegible]

Any other specific or special instruction required for insertion of this proposal into the Mining and Reclamation Plan.

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**[PROPOSAL TO REMOVE SITE FROM WATER
MONITORING PROGRAM]**

**East Mountain
Spring 80-48**

Location: Section 33, Township 16 South, Range 7 East, SLB&M. This site is located within the Deer Creek mine permit boundary.

Lease Association: Springs 80-48 is associated with federal coal lease U-024319. PacifiCorp is the leaseholder of this Federal Coal Lease. The springs are located above the 3rd North B Mains at the entrance to the 2nd West longwall panel. The mains were developed in 1977. The panels in this area have been completely extracted from the Hiawatha Seam.

Subsidence: No subsidence is reported in the vicinity of the spring. Refer to the 2008 Annual Subsidence Report data which are included herein.

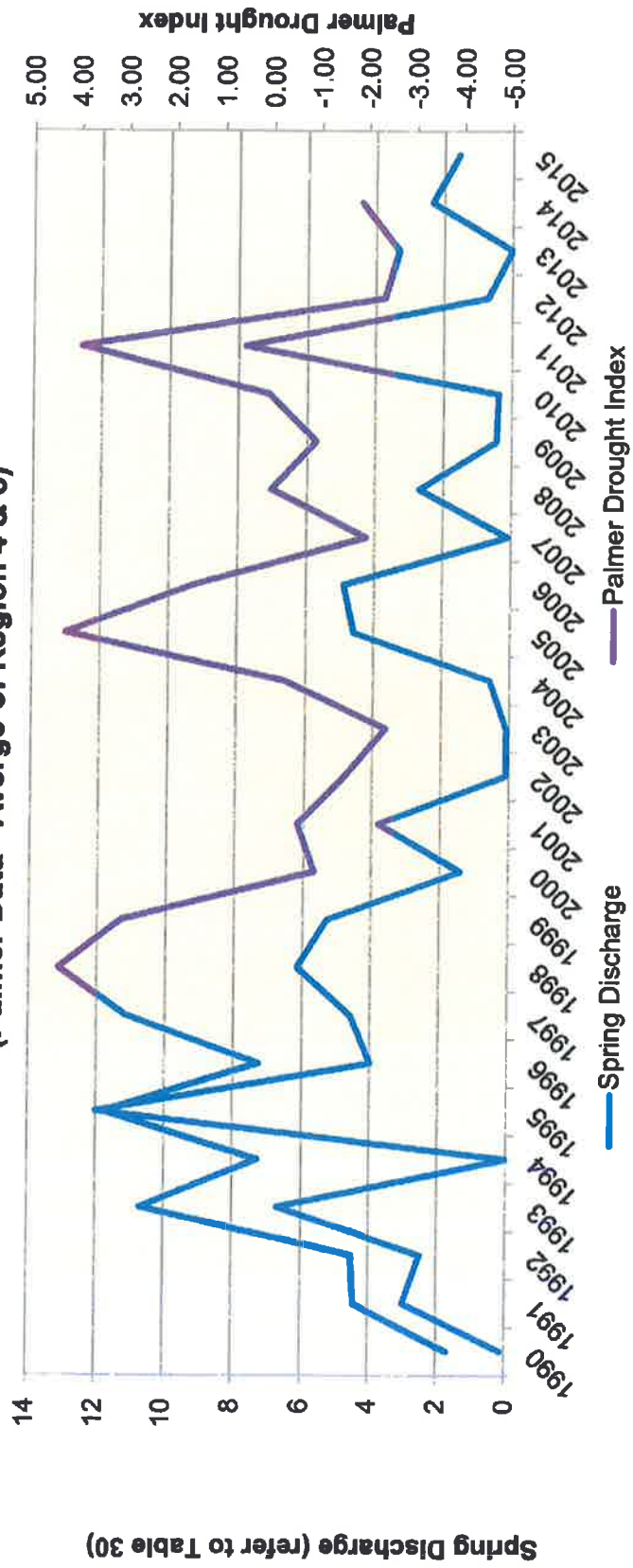
Water Data: Pre- and Post-water quality data is included for spring 80-48. Data show insignificant variances between pre- and post-quality results. Historic flow data has been collected for years 1990 through 2015 (25 years) although sampling has been conducted since 1980. This information is found on the following page where July spring flow is plotted against the Palmer Drought Index for regions 4 and 5. Spring flow shows a positive correlation with the Palmer Drought Indices. The mode of occurrence for Spring 80-48 is permeable fluvial channels that intersect land surface. The stratigraphic location for this spring is the North Horn Formation.

Justification for removal from monitoring: Site 80-48 has been monitored by Energy West Mining Company (Now Interwest Mining Company) since 1980. There have been no reported occurrences in which mining has impacted this site. Historic quality and quantity data has not indicated such impacts to the sites.

This spring was considered a strategic monitoring site as plans for accessing the Cottonwood Tract from the 2nd West Section in the Deer Creek Mine were discussed. PacifiCorp is no longer the holder of the Cottonwood Lease and therefore, has no future plans for using this access. The Deer Creek Mine was sealed in April of 2015. Although this site is located within a current federal coal lease and within the mine permit boundaries, its location is in the southern extents of the Deer Creek and Wilberg/Cottonwood permit boundaries where no mining has been conducted for at least 10 years.

This site is also located where it requires access through a certain surface private property owners land. This property owner has expressed his disliking of PacifiCorp accessing his land and has restricted access by locking gates. This owner is not always available to gives access through his property. During the big game hunting seasons within September and October, the property owner does not allow any other access except for his paid hunting clients. October is a scheduled monitoring time period. Therefore, it is requested for the reasons stated above, that the site be removed from the monitoring program.

Spring 80-48 EAST MOUNTAIN SPRING DISCHARGE vs. PALMER DROUGHT INDEX (Palmer Data - Average of Region 4 & 5)



East Mountain Spring:	80-48
Water Quality Data:	July Operational Data
Mine Association:	Deer Creek Mine
Date of Development:	Blind Canyon Seam: May 1997
Date of Second Mining:	First Mining Only

Historical Data: 1990-2014				
		MAXIMUM	MINIMUM	AVERAGE
BICARBONATE		437	272	324.65
CALCIUM		147.7	44.8	69.41
CARBONATE		5	0	1.2
CHLORIDE		15	2	4.455
CONDUCTIVITY		595	380	529.15
DISSOLVED OXYGEN		9.9	5	7.09
FLOW		12	0.13	3.71
HARDNESS		501	261	302.25
TOTAL IRON		2.6	0.05	0.44
DISSOLVED IRON		2	0	0.26
MAGNESIUM		41.4	24.1	31.29
DISSOLVED MANGANESE		0.1	0.002	0.026
MANGANESE		0.5	0	0.059
OIL AND GREASE		0	0	
PH		8.27	7.3	7.78
POTASSIUM		1	0.29	0.58
SET SOLIDS		0	0	
SODIUM		5.92	2.61	4.79
SULFATE		150	4	14.15
SUSPENDED SOLIDS		124	5	38.6
TEMPERATURE		52.8	6.4	15.1
TOTAL DISSOLVED SOLIDS		327	190	293.15



Spring: 80-48

Note: Spring was developed in 2009 as part of a cattlemen's mitigation plan associated with the Elk Spring culinary development project.



Location: T16S, R7E, Section 33
 Associated Formation: North Horn
 GPS: N 39°22'55.7"
 W 111°09'13.8"

Note: Access to spring requires travel through private property in which owner does not allow.

**[PROPOSAL TO REMOVE SITE FROM WATER
MONITORING PROGRAM]**

**East Mountain
Spring 89-65**

Location: Section 31, Township 16 South, Range 7 East, SLB&M. This site is located outside the Deer Creek mine permit boundary. The spring is located above a block of unmined coal south of the 3rd West longwall panel.

Lease Association: Springs 89-65 was associated with federal coal lease U-7653. This lease was terminated in March 2002. PacifiCorp was the sublessee of this lease. PacifiCorp notified the Lessee (Lincoln Reavis, Trustee of the Louisiana D. Brown 1992 Irrevocable Trust) in December 2001 that it was terminating its sublease agreement of this Federal Coal Lease.

Subsidence: No subsidence is reported in the vicinity of the spring. Refer to the 2008 Annual Subsidence Report data which are included herein.

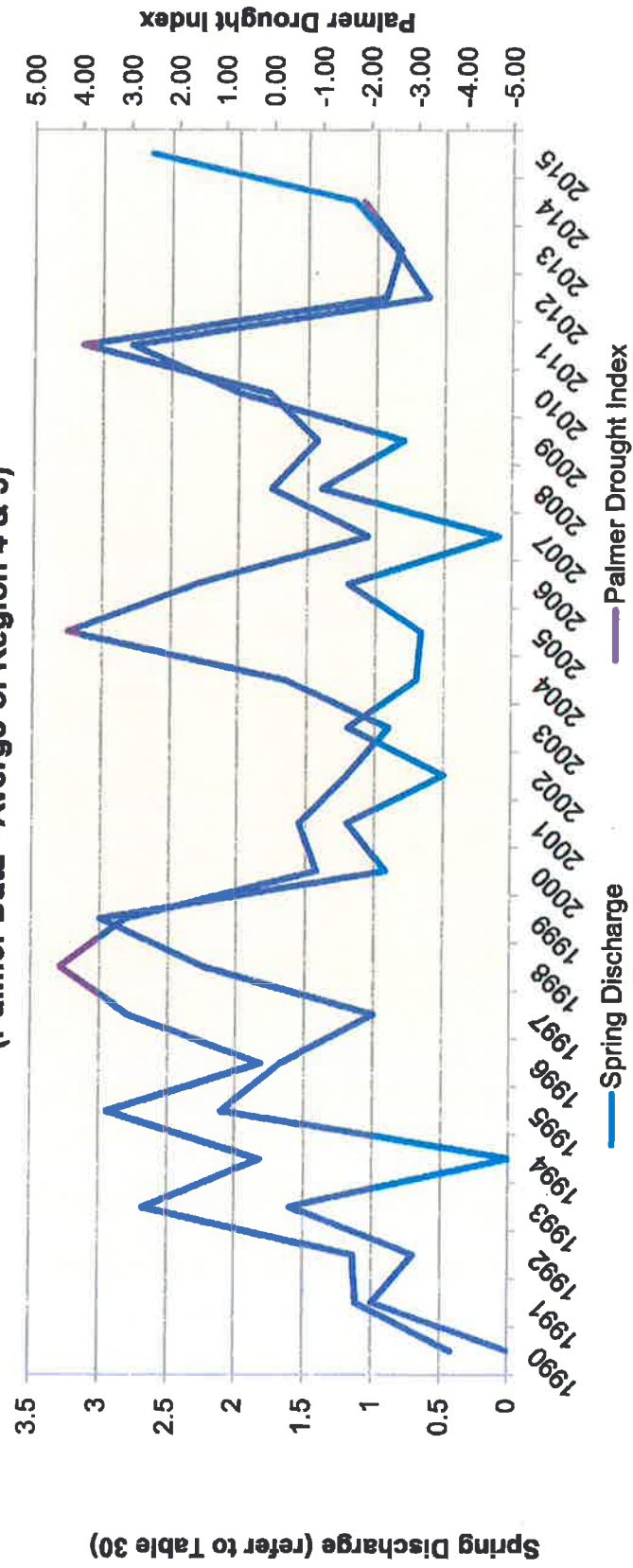
Water Data: Pre- and Post-water quality data is included for spring 89-65. Data show insignificant variances between pre- and post-quality results. Historic flow data has been collected for years 1990 through 2015 (25 years) although sampling has been conducted since 1989. This information is found on the following page where July spring flow is plotted against the Palmer Drought Index for regions 4 and 5. Spring flow shows a positive correlation with the Palmer Drought Indices. The mode of occurrence for Spring 89-65 is permeable fluvial channels that intersect land surface. The stratigraphic location for this spring is the North Horn Formation.

Justification for removal from monitoring: Site 89-65 has been monitored by Energy West Mining Company (Now Interwest Mining Company) since 1989. There have been no reported occurrences in which mining has impacted this site. Historic quality and quantity data has not indicated such impacts to the site.

This spring was considered a strategic monitoring site as plans for accessing the Cottonwood Tract from the 2nd West Section in the Deer Creek Mine were discussed. PacifiCorp is no longer the holder of the Cottonwood Lease and therefore, has no future plans for using this access. The Deer Creek Mine was sealed in April of 2015.

This site is also located where it requires access through a certain surface private property owners land. This property owner has expressed his disliking of PacifiCorp accessing his land and has restricted access by locking gates. This owner is not always available to give access through his property. During the big game hunting seasons within September and October, the property owner does not allow any other access except for his paid hunting clients. October is a scheduled monitoring time period. Therefore, it is requested for the reasons stated above, that the site be removed from the monitoring program.

Spring 89-65 **EAST MOUNTAIN** **SPRING DISCHARGE vs. PALMER DROUGHT INDEX** (Palmer Data - Average of Region 4 & 5)



East Mountain Spring: 89-65
Water Quality Data: July Operational Data
Mine Association: Deer Creek Mine
Date of Development: N/A
Date of Second Mining: N/A

Historical Data: 1990-2014			
	MAXIMUM	MINIMUM	AVERAGE
BICARBONATE	375	270	325.80
CALCIUM	170	68.3	81.77
CARBONATE	5	0	0.625
CHLORIDE	10	1.5	3.02
CONDUCTIVITY	633	488	560.65
DISSOLVED OXYGEN	9.6	4.5	7.52
FLOW	3	0.62	1.39
HARDNESS	570	262	307
TOTAL IRON	3.8	0	0.81
DISSOLVED IRON	0.1	0	0.02
MAGNESIUM	34	17.8	24.92
DISSOLVED MANGANESE	0.071	0	0.02
MANGANESE	0.1	0	0.012
OIL AND GREASE	0	0	
PH	7.86	7.35	7.56
POTASSIUM	10	0.53	1.33
SET SOLIDS	0	0	
SODIUM	10	1.82	6.87
SULFATE	20	2	13.45
SUSPENDED SOLIDS	225	2	113.50
TEMPERATURE	45.5	4.8	12.24
TOTAL DISSOLVED SOLIDS	353	248	309.30

Spring: 89-65

Location: T16S, R7E, Section 31
Associated Formation: North Horn
GPS: N 39°22'53.3"
W 111°09'26"

Note: Access to spring
requires travel through
private property in which
owner does not allow.



**[PROPOSAL TO REMOVE SITE FROM WATER
MONITORING PROGRAM]**

**East Mountain
Spring 89-66**

Location: Section 5, Township 17 South, Range 7 East, SLB&M. This site is located within the Deer Creek mine permit boundary.

Lease Association: ; Spring 89-66 is associated with federal coal lease U-084923. PacifiCorp is the sublease holder of this Federal Coal Lease. The spring is located above the extraction face of the 2nd West longwall panel in the Hiawatha Seam. The headgate and tailgate sections of this panel were started in June and July of 2004. The 2nd West panel was completed in June 2005.

Subsidence: No subsidence is reported in the vicinity of the spring. Refer to the 2008 Annual Subsidence Report data which are included herein.

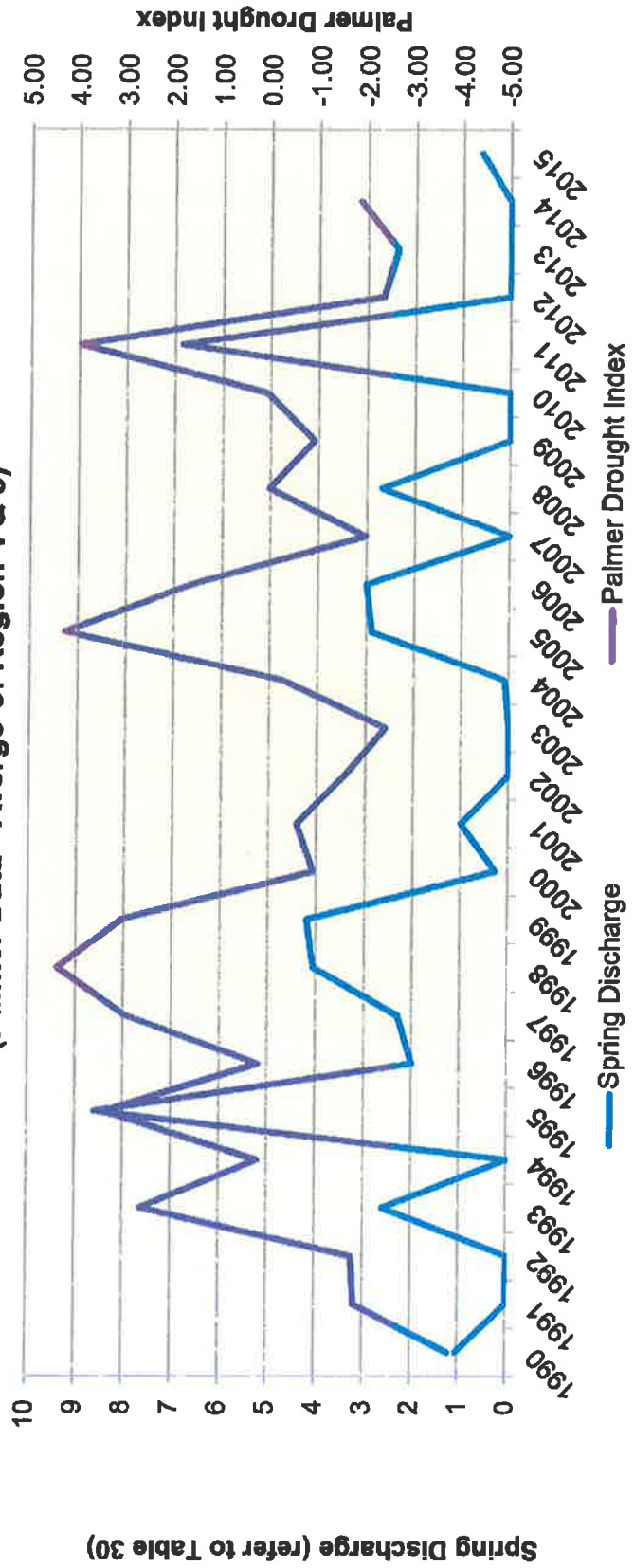
Water Data: Pre- and Post-water quality data is included for spring 89-66. Data show insignificant variances between pre- and post-quality results. Historic flow data has been collected for years 1990 through 2015 (25 years) although sampling has been conducted since 1989. This information is found on the following page where July spring flow is plotted against the Palmer Drought Index for regions 4 and 5. Spring flow shows a positive correlation with the Palmer Drought Indices. The mode of occurrence for spring 89-66 is permeable fluvial channels that intersect land surface. The stratigraphic location for this spring is the North Horn Formation.

Justification for removal from monitoring: Site 89-66 has been monitored by Energy West Mining Company (Now Interwest Mining Company) since 1989. There have been no reported occurrences in which mining has impacted this site. Historic quality and quantity data has not indicated such impacts to the site.

This spring was considered a strategic monitoring site as plans for accessing the Cottonwood Tract from the 2nd West Section in the Deer Creek Mine were discussed. PacifiCorp is no longer the holder of the Cottonwood Lease and therefore, has no future plans for using this access. The Deer Creek Mine was sealed in April of 2015.

This site is also located within a certain surface private property owners land. This property owner has expressed his disliking of PacifiCorp accessing his land and has restricted access by locking gates. This owner is not always available to gives access through his property. During the big game hunting seasons within September and October, the property owner does not allow any other access except for his paid hunting clients. October is a scheduled monitoring time period. Therefore, it is requested for the reasons stated above, that the site be removed from the monitoring program.

Spring 89-66 **EAST MOUNTAIN** **SPRING DISCHARGE vs. PALMER DROUGHT INDEX** (Palmer Data - Average of Region 4 & 5)



East Mountain Spring:	89-66
Water Quality Data:	July Operational Data
Mine Association:	Deer Creek Mine
Date of Development:	Blind Canyon Seam: 2nd West Tailgate developed June 2004
Date of Second Mining:	June 2005

Historical Data: 1990-2014

	MAXIMUM	MINIMUM	AVERAGE
BICARBONATE	397	234	292.29
CALCIUM	110.4	41.9	51.44
CARBONATE	5	0	1.20
CHLORIDE	10	4	5.25
CONDUCTIVITY	554	438	494.57
DISSOLVED OXYGEN	10.3	4.7	7.58
FLOW	8.6	0.27	3.01
HARDNESS	370	227	263.64
TOTAL IRON	1.89	0	0.55
DISSOLVED IRON	0.28	0	0.072
MAGNESIUM	36.67	23	32.74
DISSOLVED MANGANESE	0.14	0	0.039
MANGANESE	0.1	0	0.023
OIL AND GREASE	0	0	
PH	8.13	7.22	7.62
POTASSIUM	1.4	0.67	0.87
SET SOLIDS	0	0	
SODIUM	6.7	3.56	5.33
SULFATE	35	0.9	12.85
SUSPENDED SOLIDS	10	1	6.33
TEMPERATURE	45	4.7	12.18
TOTAL DISSOLVED SOLIDS	294	202	253.21

Spring: 89-66

Location: T17S, R7E, Section 5
Associated Formation: North Horn
GPS: N 39°22'44.5"
W 111°09'26.2"

Note: Spring is located within the boundaries of private property in which owner does not allow access.



**[PROPOSAL TO REMOVE SITE FROM WATER
MONITORING PROGRAM]**

**East Mountain
Spring 89-67, 89-68**

Location: Section 32, Township 16 South, Range 7 East, SLB&M. This site is located within the Deer Creek mine permit boundary.

Lease Association: ; Springs 89-67 and 89-68 are associated with federal coal lease U-47977. PacifiCorp is the lease holder of this Federal Coal Lease. The spring is located above the unmined coal barrier between 2nd West longwall panel to the south and the 3rd West longwall panel to the north. The coal reserve is situated in the Hiawatha Seam. The two entry system of the 2nd West section began development in December 1997. Longwall extraction of the 3rd West panel was completed in April 1999. The 2nd West panel was completed in June 2005.

Subsidence: No subsidence is reported in the vicinity of the spring. Refer to the 2008 Annual Subsidence Report data which are included herein.

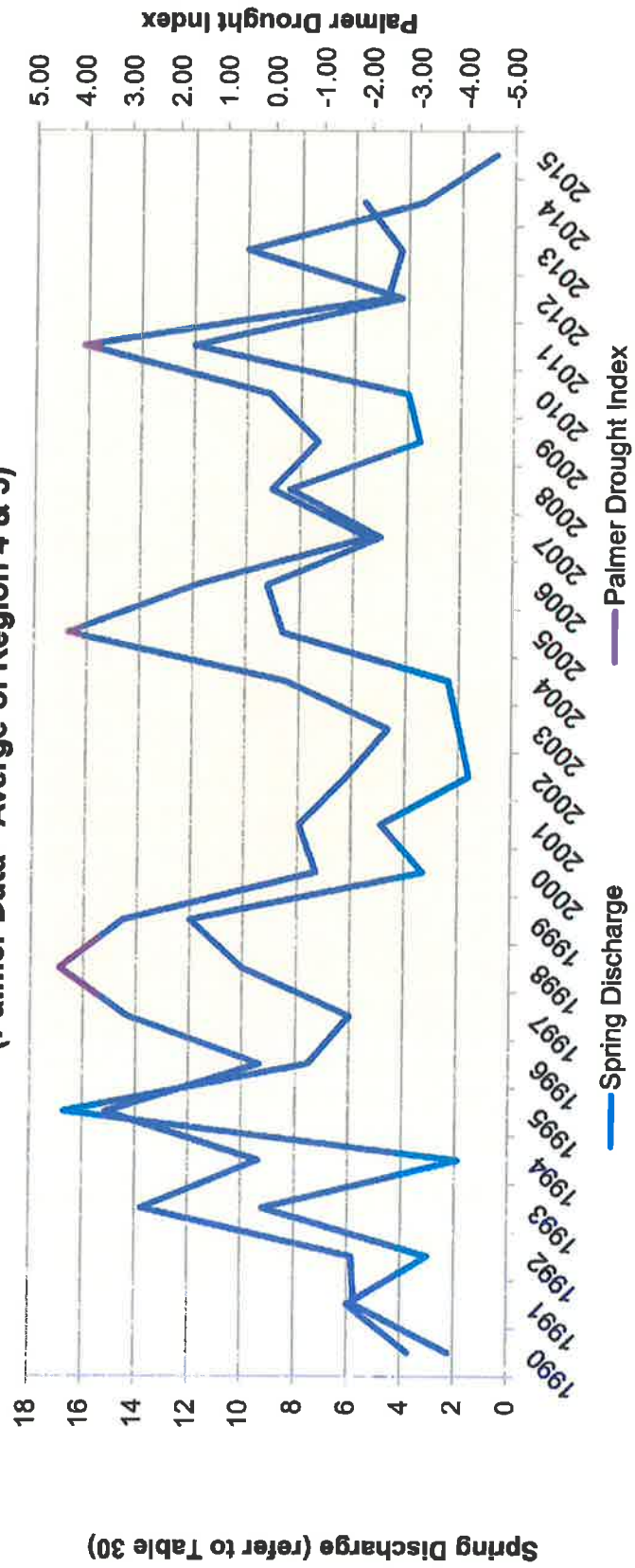
Water Data: Pre- and Post-water quality data is included for springs 89-67 and 89-68. Data show insignificant variances between pre- and post-quality results. Historic flow data has been collected for years 1990 through 2015 (25 years) although sampling has been conducted since 1989. This information is found on the following page where July spring flow is plotted against the Palmer Drought Index for regions 4 and 5. Spring flow shows a positive correlation with the Palmer Drought Indices. The mode of occurrence for springs 89-67 and 89-68 is permeable fluvial channels that intersect land surface. The stratigraphic location for this spring is the North Horn Formation.

Justification for removal from monitoring: Sites 89-67 and 89-68 have been monitored by Energy West Mining Company (Now Interwest Mining Company) since 1989. There have been no reported occurrences in which mining has impacted these sites. Historic quality and quantity data has not indicated such impacts to the sites.

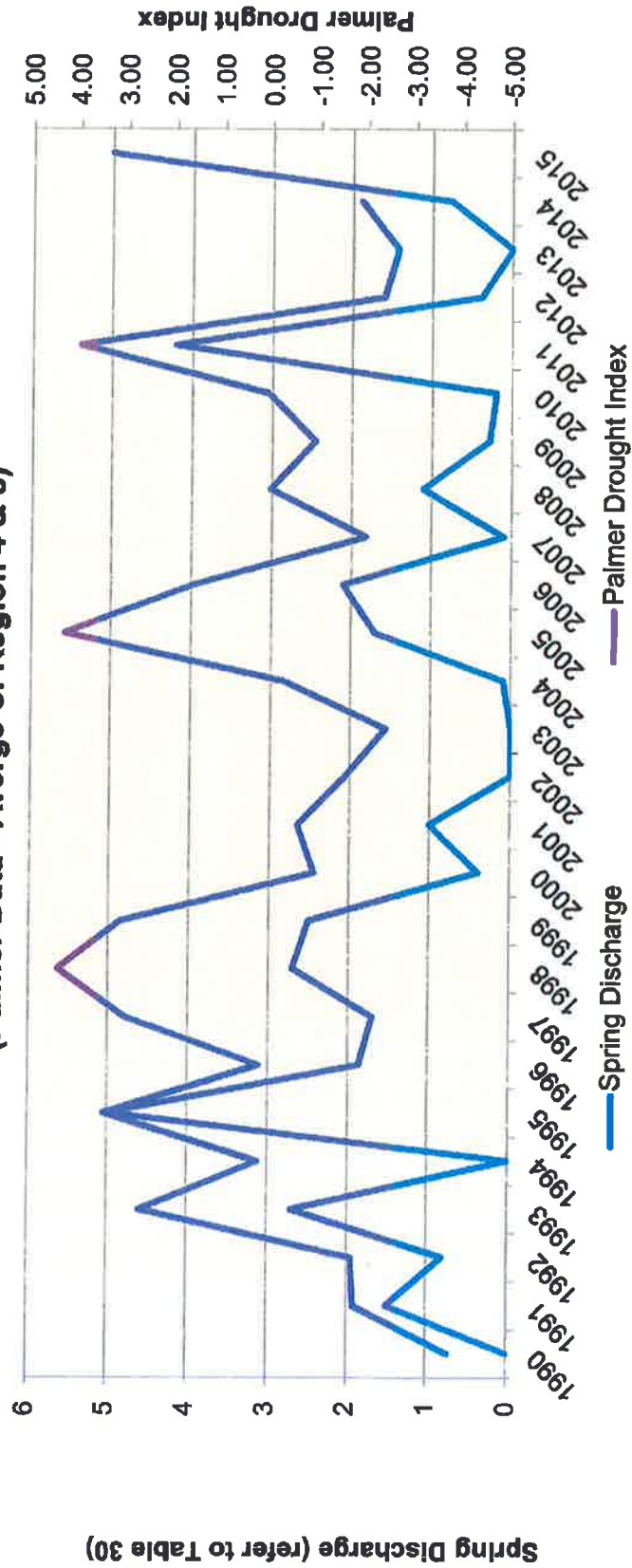
These springs were considered strategic monitoring sites as plans for accessing the Cottonwood Tract from the 2nd West Section in the Deer Creek Mine were discussed. PacifiCorp is no longer the holder of the Cottonwood Lease and therefore, has no future plans for using this access. The Deer Creek Mine was sealed in April of 2015.

These sites are also located where it requires access through a certain surface private property owners land. This property owner has expressed his disliking of PacifiCorp accessing his land and has restricted access by locking gates. This owner is not always available to gives access through his property. During the big game hunting seasons within September and October, the property owner does not allow any other access except for his paid hunting clients. October is a scheduled monitoring time period. Therefore, it is requested for the reasons stated above, that the site be removed from the monitoring program.

Spring 89-67 EAST MOUNTAIN SPRING DISCHARGE vs. PALMER DROUGHT INDEX (Palmer Data - Average of Region 4 & 5)



Spring 89-68 EAST MOUNTAIN SPRING DISCHARGE vs. PALMER DROUGHT INDEX (Palmer Data - Average of Region 4 & 5)



East Mountain Spring: 89-67
Water Quality Data: July Operational Data
Mine Association: Deer Creek Mine
Date of Development: N/A
Date of Second Mining: N/A

Historical Data: 1990-2014			
	MAXIMUM	MINIMUM	AVERAGE
BICARBONATE	368	232	295.71
CALCIUM	76.8	33.9	52.13
CARBONATE	5	0	0.70
CHLORIDE	10	3.5	5.26
CONDUCTIVITY	583	473	534.75
DISSOLVED OXYGEN	10.4	5	7.37
FLOW	16.7	1.6	6.36
HARDNESS	342	211	268.83
TOTAL IRON	1	0	0.29
DISSOLVED IRON	0.2	0	0.044
MAGNESIUM	36.5	30.6	33.62
DISSOLVED MANGANESE	0.038	0	0.011
MANGANESE	0.2	0	0.031
OIL AND GREASE	0	0	
PH	8.26	7.21	7.64
POTASSIUM	5	0.4	1.26
SET SOLIDS	0	0	
SODIUM	17	8.2	11.89
SULFATE	65	9	18.83
SUSPENDED SOLIDS	8	2	4.60
TEMPERATURE	40.8	3.6	11.48
TOTAL DISSOLVED SOLIDS	313	190	282.67

East Mountain Spring: 89-68
Water Quality Data: July Operational Data
Mine Association: Deer Creek Mine
Date of Development: N/A
Date of Second Mining: N/A

Historical Data: 1990-2014

	MAXIMUM	MINIMUM	AVERAGE
BICARBONATE	368	232	295.71
CALCIUM	76.8	33.9	52.13
CARBONATE	5	0	0.70
CHLORIDE	10	3.5	5.26
CONDUCTIVITY	583	473	534.75
DISSOLVED OXYGEN	10.4	5	7.37
FLOW	16.7	1.6	6.36
HARDNESS	342	211	268.83
TOTAL IRON	1	0	0.29
DISSOLVED IRON	0.2	0	0.044
MAGNESIUM	36.5	30.6	33.62
DISSOLVED MANGANESE	0.038	0	0.011
MANGANESE	0.2	0	0.031
OIL AND GREASE	0	0	
PH	8.26	7.21	7.64
POTASSIUM	5	0.4	1.26
SET SOLIDS	0	0	
SODIUM	17	8.2	11.89
SULFATE	65	9	18.83
SUSPENDED SOLIDS	8	2	4.60
TEMPERATURE	40.8	3.6	11.48
TOTAL DISSOLVED SOLIDS	313	190	282.67



Spring: 89-67

Location: T16S, R7E, Section 32
 Associated Formation: North Horn
 GPS: N 39°22'44.5"
 W 111°09'26.2"

Note: Access to spring
 requires travel through
 private property in which
 owner does not allow.



Note: Spring was developed
 in 2009 as part of a
 cattlemen's mitigation plan
 associated with the Elk
 Spring culinary development
 project.

Spring: 89-68

Location: T16S, R7E, Section 32
Associated Formation: North Horn
GPS: N 39°22'53.6"
W 111°09'21.4"

Note: Access to spring requires travel through private property in which owner does not allow.

Note: Spring was developed in 2009 as part of a cattlemen's mitigation plan associated with the Elk Spring culinary development project.



**[PROPOSAL TO REMOVE SITE FROM WATER
MONITORING PROGRAM]**

**East Mountain Well
EM-31**

Location: Section 24, Township 17 South, Range 6 East, SLB&M. This site is located within the Deer Creek mine permit boundary. The well head is located on alluvial deposits just above the Trail Mountain Mine portals.

Lease Association: ; Well EM-31 is associated with federal coal lease U-083066. PacifiCorp is the sublease holder of this Federal Coal Lease. The well is located within unmined coal managed by the BLM and was developed on surface lands managed by the USFS.

Subsidence: No subsidence is reported in the vicinity of the well. Refer to the 2008 Annual Subsidence Report data which are included herein. No mining has occurred with 1000 feet of this site.

Water Data: Level data is included for well EM-31. Data show insignificant fluctuations of water level. Historic data has been collected for years 1980 through 2015 (35 years) although the well was developed in 1978. The total depth of the well is 280 feet. The elevation at the collar is 7417.8 feet. The drill hole diameter is 9.75 inches and fitted with a 4 inch (ID) casing and packed with gravel to within 50 feet of surface. Perforations were set between 180 feet and 250 feet. The annular is cemented from 0-50 feet. The lithologic well log is attached.

Justification for removal from monitoring: Well EM-31 has been monitored by Energy West Mining Company (Now Interwest Mining Company) since 1980. There have been no reported occurrences in which mining has impacted this site. Historic level data has not indicated such impacts to the site.

Originally, the site was developed to assess the piezometric gradient of the western reserves of the Wilberg Mine. Water elevation of the well was the only parameter ever monitored. The hydrograph of EM-31 shows that the well responds subtly to annual precipitation and long-term climatic cycles. We believe that these hydraulic responses are due in large part to hydraulic communication between the gravel-pack zone and shallow, overlying groundwater systems. The Star Point Sandstone, in other locations, does not respond to annual precipitation or climatic trends.

Since there is no longer mining in Cottonwood/Wilberg or Deer Creek mines, PacifiCorp see's no reason to retain this site as a required monitoring location. Therefore, it is requested for the reasons stated above, that the site be removed from the monitoring program.

**WELL EM-31
EAST MOUNTAIN**
(Well Elevation vs. Palmer Drought Index)

